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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER	
LEWIS, BEN	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
10/10/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM
mkraft@hp.com
ipa.mail@hp.com

Office Action Summary	Application No.	Applicant(s)	
	10/674,053	ULMER ET AL.	
	Examiner	Art Unit	
	Ben Lewis	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7,24,25 and 28-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-7,24,25 and 28-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Detailed Action

1. The Applicant's amendment filed on July 11th, 2008 was received. Claims 1,5,11,24 and 31 were amended. Claims 7, 33 and 36-39 were cancelled.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action (issued on February 11th, 2008).

Claim Rejections - 35 USC § 112

3. The claim rejections under 35 U.S.C. 112, second paragraph, on claim 1 are withdrawn, because the claim has been amended..

Claim Rejections - 35 USC § 103

4. Claim 1, 3-7 and 28-45 rejected under 35 U.S.C. 103(a) as being unpatentable over (U.S. Pub. No. 2003/0008184 A1).

With respect to claims 1, 28, 34 and 40, Ballantine et al. disclose a method and apparatus for controlling a combined heat and power fuel cell system (title).

Regarding the function of the controller, Ballantine et al. teach a controller is adapted to coordinate response to data signals from the power sink and the heat sink. As examples, such data signals from the heat sink may include a temperature indication or a heat demand signal (such as from a thermostat), and such data signals from the

power sink may include a voltage or current measurement, an electrical power demand signal, or an electrical load (Paragraph 0013).

Regarding the function of the switch circuit, Ballantine et al. teach that the invention provides an embodiment where the balance between the heat and power demand signals is accommodated by selectively connecting at least two fuel cells within a group to increase the amount of heat that is generated for a given amount of power production. Where a system is adapted to selectively connect one or more cells in parallel, the cells that are selectively connected are connected via a switched network, rather than being stack in series as in a conventional stack. For example, two fuel cells may be connected to a switch that is connected to two electrical paths. When the system controller causes the switch to select one of the paths, this results in the cell being connected in series with another cell. When the other path is selected, the cell will be connected in parallel (e.g., connected to a common bus) (Paragraph 0130).

With respect to a temperature measurement circuit, Ballentine et al. teach that a controller is adapted to coordinate response to data signals from the power sink and the heat sink. As examples, such data signals from the heat sink may include a temperature indication or a heat demand signal (such as from a thermostat), and such data signals from the power sink may include a voltage or current measurement, an electrical power demand signal, or an electrical load (Paragraph 0013).

Ballantine et al. teach that the system also performs a check 612 for a heat demand signal. If there is no heat demand signal, the system continues in optimization mode 610. Where there is a heat demand signal, the system then performs an increase

614 in the reactant flow rates. For example, in this example, for a constant power demand, increasing the fuel flow rate will increase the amount of unreacted fuel in the fuel cell exhaust that is processed in the oxidizer to generate heat (Paragraph 0079).

Ballentine et al. do not specifically teach switching to a more serial if more heat is required and switching to a more parallel configuration if less heat is required. However, in the system of Ballentine et al. all the elements are present therefore it would have been obvious one of ordinary skill in the art at the time the invention was made to switch the fuel cell system of Ballentine et al. in the same manner as claimed by applicant since applicant claimed an apparatus an all the elements of applicant's claimed apparatus are present in the fuel cell system of Ballentine et al.

With respect to claims 4, 6 and 7, Ballantine et al. teach that the invention provides an embodiment where the balance between the heat and power demand signals is accommodated by selectively connecting at least two fuel cells within a group to increase the amount of heat that is generated for a given amount of power production. Where a system is adapted to selectively connect one or more cells in parallel, the cells that are selectively connected are connected via a switched network, rather than being stack in series as in a conventional stack. For example, two fuel cells may be connected to a switch that is connected to two electrical paths. When the system controller causes the switch to select one of the paths, this results in the cell being connected in series with another cell. When the other path is selected, the cell will be connected in parallel (e.g., connected to a common bus) (Paragraph 0130).

With respect to claim 5, Ballantine et al. teach that the invention provides an embodiment where the balance between the heat and power demand signals is accommodated by selectively connecting at least two fuel cells within a group to increase the amount of heat that is generated for a given amount of power production. Where a system is adapted to selectively connect one or more cells in parallel, the cells that are selectively connected are connected via a switched network, rather than being stack in series as in a conventional stack. For example, two fuel cells may be connected to a switch that is connected to two electrical paths. When the system controller causes the switch to select one of the paths, this results in the cell being connected in series with another cell. When the other path is selected, the cell will be connected in parallel (e.g., connected to a common bus) (Paragraph 0130).

With respect to a temperature measurement circuit, Ballentine et al. teach that teach a controller is adapted to coordinate response to data signals from the power sink and the heat sink. As examples, such data signals from the heat sink may include a temperature indication or a heat demand signal (such as from a thermostat), and such data signals from the power sink may include a voltage or current measurement, an electrical power demand signal, or an electrical load (Paragraph 0013).

With respect to claim 29, Ballantine et al. teach that the invention provides an embodiment where the balance between the heat and power demand signals is accommodated by selectively connecting at least two fuel cells within a group to increase the amount of heat that is generated for a given amount of power production. Where a system is adapted to selectively connect one or more cells in parallel, the cells that are selectively connected are connected via a switched network, rather than being stack in series as in a conventional stack. For example, two fuel cells may be connected to a switch that is connected to two electrical paths. When the system controller causes the switch to select one of the paths, this results in the cell being connected in series with another cell. When the other path is selected, the cell will be connected in parallel (e.g., connected to a common bus) (Paragraph 0130).

With respect to claim 30, Ballantine et al. teach that the system also performs a check 612 for a heat demand signal. If there is no heat demand signal, the system continues in optimization mode 610. Where there is a heat demand signal, the system then performs an increase 614 in the reactant flow rates. For example, in this example, for a constant power demand, increasing the fuel flow rate will increase the amount of unreacted fuel in the fuel cell exhaust that is processed in the oxidizer to generate heat (Paragraph 0079).

With respect to claims 31-33, 35 and 44, Ballantine et al. teach that the invention provides an embodiment where the balance between the heat and power demand

signals is accommodated by selectively connecting at least two fuel cells within a group to increase the amount of heat that is generated for a given amount of power production. Where a system is adapted to selectively connect one or more cells in parallel, the cells that are selectively connected are connected via a switched network, rather than being stack in series as in a conventional stack. For example, two fuel cells may be connected to a switch that is connected to two electrical paths. When the system controller causes the switch to select one of the paths, this results in the cell being connected in series with another cell. When the other path is selected, the cell will be connected in parallel (e.g., connected to a common bus) (Paragraph 0130).

With respect to a temperature measurement circuit, Ballantine et al. teach that teach a controller is adapted to coordinate response to data signals from the power sink and the heat sink. As examples, such data signals from the heat sink may include a temperature indication or a heat demand signal (such as from a thermostat), and such data signals from the power sink may include a voltage or current measurement, an electrical power demand signal, or an electrical load (Paragraph 0013).

Ballantine et al. teach that the system also performs a check 612 for a heat demand signal. If there is no heat demand signal, the system continues in optimization mode 610. Where there is a heat demand signal, the system then performs an increase 614 in the reactant flow rates. For example, in this example, for a constant power demand, increasing the fuel flow rate will increase the amount of unreacted fuel in the fuel cell exhaust that is processed in the oxidizer to generate heat (Paragraph 0079).

With respect to claims 37 and 43, Ballantine et al. teach that the invention provides an embodiment where the balance between the heat and power demand signals is accommodated by selectively connecting at least two fuel cells within a group to increase the amount of heat that is generated for a given amount of power production. Where a system is adapted to selectively connect one or more cells in parallel, the cells that are selectively connected are connected via a switched network, rather than being stack in series as in a conventional stack. For example, two fuel cells may be connected to a switch that is connected to two electrical paths. When the system controller causes the switch to select one of the paths, this results in the cell being connected in series with another cell. When the other path is selected, the cell will be connected in parallel (e.g., connected to a common bus) (Paragraph 0130).

With respect to a temperature measurements, Ballentine et al. teach that a controller is adapted to coordinate response to data signals from the power sink and the heat sink. As examples, such data signals from the heat sink may include a temperature indication or a heat demand signal (such as from a thermostat), and such data signals from the power sink may include a voltage or current measurement, an electrical power demand signal, or an electrical load (Paragraph 0013).

With respect to claims 38, Ballantine et al. teach that the invention provides an embodiment where the balance between the heat and power demand signals is accommodated by selectively connecting at least two fuel cells within a group to increase the amount of heat that is generated for a given amount of power production.

Where a system is adapted to selectively connect one or more cells in parallel, the cells that are selectively connected are connected via a switched network, rather than being stack in series as in a conventional stack. For example, two fuel cells may be connected to a switch that is connected to two electrical paths. When the system controller causes the switch to select one of the paths, this results in the cell being connected in series with another cell. When the other path is selected, the cell will be connected in parallel (e.g., connected to a common bus) (Paragraph 0130).

With respect to a temperature measurement circuit, Ballantine et al. teach that teach a controller is adapted to coordinate response to data signals from the power sink and the heat sink. As examples, such data signals from the heat sink may include a temperature indication or a heat demand signal (such as from a thermostat), and such data signals from the power sink may include a voltage or current measurement, an electrical power demand signal, or an electrical load (Paragraph 0013).

Ballantine et al. teach that the system also performs a check 612 for a heat demand signal. If there is no heat demand signal, the system continues in optimization mode 610. Where there is a heat demand signal, the system then performs an increase 614 in the reactant flow rates. For example, in this example, for a constant power demand, increasing the fuel flow rate will increase the amount of unreacted fuel in the fuel cell exhaust that is processed in the oxidizer to generate heat (Paragraph 0079).

With respect to claims 39, 41, 42 and 45 Ballantine et al. teach that the invention provides an embodiment where the balance between the heat and power demand

signals is accommodated by selectively connecting at least two fuel cells within a group to increase the amount of heat that is generated for a given amount of power production. Where a system is adapted to selectively connect one or more cells in parallel, the cells that are selectively connected are connected via a switched network, rather than being stack in series as in a conventional stack. For example, two fuel cells may be connected to a switch that is connected to two electrical paths. When the system controller causes the switch to select one of the paths, this results in the cell being connected in series with another cell. When the other path is selected, the cell will be connected in parallel (e.g., connected to a common bus) (Paragraph 0130).

Ballantine et al. teach that the system also performs a check 612 for a heat demand signal. If there is no heat demand signal, the system continues in optimization mode 610. Where there is a heat demand signal, the system then performs an increase 614 in the reactant flow rates. For example, in this example, for a constant power demand, increasing the fuel flow rate will increase the amount of unreacted fuel in the fuel cell exhaust that is processed in the oxidizer to generate heat (Paragraph 0079).

5. Claim 24 is rejected under rejected under 35 U.S.C. 103(a) as being unpatentable over (U.S. Pub. No. 2003/0008184 A1).

With respect to claim 24, Ballantine et al. disclose a method and apparatus for controlling a combined heat and power fuel cell system (title).

Regarding means for supplying an excess amount of fuel and producing heat from the excess amount of fuel, Ballantine et al. teach that the system also performs a

check 612 for a heat demand signal. If there is no heat demand signal, the system continues in optimization mode 610. Where there is a heat demand signal, the system then performs an increase 614 in the reactant flow rates. For example, in this example, for a constant power demand, increasing the fuel flow rate will increase the amount of unreacted fuel in the fuel cell exhaust that is processed in the oxidizer to generate heat (Paragraph 0079).

Regarding identifying whether more or less heat is required, Ballantine et al. teach that the system also performs a check 612 for a heat demand signal. If there is no heat demand signal, the system continues in optimization mode 610. Where there is a heat demand signal, the system then performs an increase 614 in the reactant flow rates. For example, in this example, for a constant power demand, increasing the fuel flow rate will increase the amount of unreacted fuel in the fuel cell exhaust that is processed in the oxidizer to generate heat (Paragraph 0079).

Regarding means for switching Ballantine et al. teach that the invention provides an embodiment where the balance between the heat and power demand signals is accommodated by selectively connecting at least two fuel cells within a group to increase the amount of heat that is generated for a given amount of power production. Where a system is adapted to selectively connect one or more cells in parallel, the cells that are selectively connected are connected via a switched network, rather than being stack in series as in a conventional stack. For example, two fuel cells may be connected to a switch that is connected to two electrical paths. When the system controller causes the switch to select one of the paths, this results in the cell being

connected in series with another cell. When the other path is selected, the cell will be connected in parallel (e.g., connected to a common bus) (Paragraph 0130).

Ballentine et al. do not specifically teach switching to a more serial if more heat is required and switching to a more parallel configuration if less heat is required. However, in the system of Ballentine et al. all the elements are present therefore it would have been obvious one of ordinary skill in the art at the time the invention was made to switch the fuel cell system of Ballentine et al. in the same manner as claimed by applicant since applicant claimed an apparatus an all the elements of applicant's claimed apparatus are present in the fuel cell system of Ballentine et al.

6. Claim 25 is rejected under rejected under 35 U.S.C. 103(a) as being unpatentable over (U.S. Pub. No. 2003/0008184 A1).

With respect to claim 25, Ballantine et al. disclose a method and apparatus for controlling a combined heat and power fuel cell system (title).

Regarding means for supplying a constant amount of fuel and producing heat from the excess amount of fuel, Ballantine et al. teach that the system also performs a check 612 for a heat demand signal. If there is no heat demand signal, the system continues in optimization mode 610. Where there is a heat demand signal, the system then performs an increase 614 in the reactant flow rates. For example, in this example, for a constant power demand, increasing the fuel flow rate will increase the amount of unreacted fuel in the fuel cell exhaust that is processed in the oxidizer to generate heat (Paragraph 0079).

Regarding means for switching Ballantine et al. teach that the invention provides an embodiment where the balance between the heat and power demand signals is accommodated by selectively connecting at least two fuel cells within a group to increase the amount of heat that is generated for a given amount of power production. Where a system is adapted to selectively connect one or more cells in parallel, the cells that are selectively connected are connected via a switched network, rather than being stack in series as in a conventional stack. For example, two fuel cells may be connected to a switch that is connected to two electrical paths. When the system controller causes the switch to select one of the paths, this results in the cell being connected in series with another cell. When the other path is selected, the cell will be connected in parallel (e.g., connected to a common bus) (Paragraph 0130).

Regarding means for reducing fuel efficiency, Ballantine et al. teach that in another embodiment, the method includes shorting at least one fuel cell within the fuel cell stack in response to a control signal to provide additional heat into a fuel cell stack coolant fluid. In another embodiment, the method may include selectively electrically connecting fuel cells in a low efficiency mode (e.g., some cells in parallel rather than in series) in response to a control signal (e.g., a heat demand signal as from a thermostat) to provide additional heat into a fuel cell stack coolant fluid (Paragraph 0095).

Regarding means for increasing EMF efficiency, Ballantine et al. teach that referring to FIG. 7, another flow diagram 700 is shown of a control scheme for a CHP fuel cell system to illustrate various logical options that may be implemented by a system to balance a combination of heat and power demand signals. In a first state

702, there is a power demand, but no heat demand. In response, the system lowers the reactant flow rates in step 704 to a point where the power demand can still be met. Step 704 serves to maximize fuel efficiency. In this mode, the system also exhausts its waste heat to ambient in a step 706 (e.g., the environment outside the fuel cell system, or to the atmosphere) (Paragraph 0082).

Ballentine et al. do not specifically teach switching to a more serial if more heat is required and switching to a more parallel configuration if less heat is required. However, in the system of Ballentine et al. all the elements are present therefore it would have been obvious one of ordinary skill in the art at the time the invention was made to switch the fuel cell system of Ballentine et al. in the same manner as claimed by applicant since applicant claimed an apparatus an all the elements of applicant's claimed apparatus are present in the fuel cell system of Ballentine et al.

Response to Arguments

7. Applicant's arguments filed on July 11th, 2008 have been fully considered but they are not persuasive.

Applicant's principal arguments are

(a) Referring to [0013], Ballantine does not actually state which configuration, parallel or series, results in greater heat production. However, in the first several lines of [0130], Ballantine discloses use of a parallel configuration to create more heat energy. This disclosure is not what the Applicant recited in Claim 1, wherein Applicant recites using

"the switch circuit to switch to a more serial configuration if more heat is required and switches to a more parallel configuration if less heat is required" and further recites "the controller increases heat production by increasing fuel consumption by switching to a more serial configuration and decreases heat production by decreasing fuel consumption by switching to a more parallel configuration." Thus, Ballantine has failed to disclose that a serial configuration results in greater heat production, and in fact discloses the opposite.

In response to Applicant's arguments, please consider the following comments.

(a) In response to applicant's argument that *"Ballantine does not actually state which configuration, parallel or series, results in greater heat production"*, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In this case, Ballentine et al. do not specifically teach switching to a more serial if more heat is required and switching to a more parallel configuration if less heat is required. However, in the system of Ballentine et al. all the elements are present therefore it would have been obvious one of ordinary skill in the art at the time the invention was made to switch the fuel cell system of Ballentine et al. in the same manner as claimed by applicant since applicant claimed an apparatus an all

the elements of applicant's claimed apparatus are present in the fuel cell system of Ballentine et al.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ben Lewis/
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795